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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/559,979	12/08/2005	John Kouvetakis	05-720-US1	6573

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EXAMINER	
RAO, SHRINIVAS H	
ART UNIT	PAPER NUMBER
2814	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/559,979	KOUVETAKIS ET AL.	
	Examiner	Art Unit	
	Steven H. Rao	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 12/08/06 (13 Pages)
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Amendment

Applicants' amendment filed on December 11, 2006 has been entered and forwarded to the examiner on December 27, 2006.

Therefore claim1 as amended ; claims 2-3 as previously recited and claims 4-27 presently newly added are currently pending in the Application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9 to17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear whether claims 9 to 17 are claiming a method or a product. Claims 9 10 17 recite " a method as {ultimately } claimed in claim 1.. " But claim 1 is a product claim rendering claims 9 to 17 indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

A. Claims 1 to 12, 14-17 and 19-27 are are rejected under 35 U.S.C. 102(b) as being anticipated by Soref et al. (U.S. Patent No. 5,548,128, hereinafter Soref).

With respect to claim 1 Soref describes a semiconductor structure comprising : a substrate (Soref figs. 1 or 2 # 1), a SnzGel-z layer formed over the substrate(Soref figs. 1 or 2 #13, col. 2 line 45-47) and an essentially single-phase Ge1-x-y-Snx-Siy layer formed over the SnzGel-z layer(Soref figs. 1 or 2 # 19, col. 3 line 44-45, It is noted that it is readily apparent to one skilled in the art that Soren's uses the same material for the same material (Si-Ge-Sn) alloy for the same purpose (strain free layers) therefore what is true for Applicants' (SI-Ge-Sn alloys are particulary suitable to form highly uniform (i.e substantially single phase) is also true for Soren . Further Applicants' specification para 0032 states (in relevant parts) " materials like Si-ge-Sn alloys are chosen because they form highly uniform layers , all of which make it clear to one of ordinary skill in the art , that Soren also discloses its layer to be highly uniform i.e. consists elemental uniformity of material that is consistent with single phase alloy layer. , see also response to Applicants' argument section below).

With respect to claim 2 Soref describes the semiconductor structure of claim 1 wherein the substrate comprises silicon. (Soref fig. 2 # 1, col. 2 lines 40-42).

With respect to claims 4 to 6 Soref describes the structure of claim 1, wherein x is about 0.01 to about 0.25; and y is about 0.01 to about 0.II and silicon substrate .(Soref col. 2 lines 39, 60-65, col. 3 line 29,44, abstract ,claim16,etc.)

With respect to claims 7 and 8 describes the structure of claim 1, wherein the Ge1-x-ySixSny layer is strained (abstract line 5 and relaxed abstract line 9).

With respect to claim 9 , to the extent understood, Soref describes a method to prepare the semiconductor structure according to claim 1, comprising the steps of, providing a substrate; depositing a SnzGel-z layer over the substrate; and depositing a Ge1_x_ySixSny layer over the SnzGel-z layer. 9 reejcted for reasons set out under claim 1 above).

With respect to claim I0 , to the extent understood, Soref describes the method of claim 9, wherein the Gel-x-ySixSny layer is deposited by precursor chemical vapor deposition, wherein the precursor chemical vapor comprises SnD4 and H3SiGeHB. (Soref col.2 lines 15-20).

With respect to claim 11, to the extent understood, Soref describes the method of claim 9, wherein the SnzGel-z layer is deposited by precursor chemical vapor deposition, wherein the precursor chemical vapor comprises SnD and Ge2H6. (soref col. 2)

With respect to claim 12, to the extent understood, Soref describes the method of claim 9, wherein the substrate comprises silicon. (Soref col.2 line 42)

With respect to claims 14 to 16 , to the extent understood, Soref describes the method of claim 9, wherein z is about 0.01 to about 0.05, wherein x is about 0.01 to about 0.25; and y is about 0.01 to about 0.11 and , wherein x is about 0.01 to about 0.25; y is about 0.01 to about 0.Ii; z is about 0.01 to about 0.05; and the substrate comprises silicon. (rejected for reasons et out under claims 4 to 6 above).

With respect to claim 19 Soref describes an alloy of the formula, Ge1_x_ySixSny, wherein x is about 0.01 to about 0.25 and y is about 0.01 to about 0.II. (rejected for reasons set out claim1 above).

With respect to claim 20 Soref describes the alloy of Claim 19, wherein x is about 0.13 to about 0.20, y is about 0.07 to about 0.11 and is about 0.01 to about 0.06. (rejected for reasons set out under claims 4-6, 19-22 above).

With respect to claim 23 Soref a semiconductor structure comprising: a substrate, a SnzGel-z layer formed over the substrate, and a layer of the alloy of Claim 19 formed over the SnzGel-z layer.(rejected for reasons set out under claims 1 and 19 above).

With respect to claim 24 Soref describes the semiconductor structure of claim 23 wherein the substrate comprises silicon. (rejected for reasons set out under claim 2 above).

With respect to claims 25 and 26 Soref describes the semiconductor structure of Claim 1 wherein the SnzGel-z and Ge1-x-ySixSny layers are lattice-matched. (rejected for easons et out under claims 7-8 above).

With respect to claim 27 Soref describes a structure comprising: a SnzGel-z layer and a layer of the alloy of Claim 19 formed over the SnzGe1_z layer. (rejected for reasons set out under claims 1,19 , above).

B. Claims 3,13 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Fiesalmann (U.S. Patent No. 4,777,023, herein after Fieselmann).

With respect to claim 3 Fiesalmann describes a method for synthesizing a compound having the molecular formula H3Si-GeH3 (Fieselman Exs. 1 to 7, etc.) , the method comprising combining H3SiO3SCF3 with KGeH3 under conditions whereby H3SiGeH3 is obtained. (co1.2 lines 37 to 46).

With respect to claim 13, to the extent understood, Fiesalmann describes the method of claim 9, further comprising the step of annealing the SnzGe1_z layer prior to depositing the Ge1_x-ySixSny layer. (Fieselmann examples).

With respect to claim 18 Fieselmann describes the method of claim 3, wherein the H3SiO3SCF3 and KGeH3 are combined at about -60°C. (Fieselmann ex. 3,etc.).

R*esponse to Arguments*

Applicant's arguments filed 12/27/2006 have been fully considered but they are not persuasive for the following reasons :

Applicants' first argument that Soref teachings should be limited to other than single phase alloy is not persuasive because Applicants' are trying unduly narrowly interpert Soref's teachings.

Soref's col.3 lines 25-27 cite d by Applicants' in support of their narrow interpretation states :

The layer can be constructed... i.e. the strained layer can be spatially varying or not spatially varying and in the embodiment wherein the strained is not spatially varying applicants' arguments are not persuasive.

It is noted that it is readily apparent to one skilled in the art that Soren's uses the same material for the same material (Si-Ge-Sn) alloy for the same purpose (strain free

layers) therefore what is true for Applicants' (SI-Ge-Sn alloys are particulary suitable to form highly uniform (i.e substantially single phase) is also true for Soren . Further Applicants' specification para 0032 states (in relevant parts) " materials like Si-ge-Sn alloys are chosen because they form highly uniform layers , all of which make it clear to one of ordinary skill in the art , that Soren also discloses its layer to be highly uniform i.e. consists elemental uniformity of material that is consistent with single phase alloy layer. , see also response to Applicants' argument section below).

Therefore Applicants' own specification (it is noted that Applicants' are same in Soref and herein) including para 0032 clearly shows to one of ordinary skill in the art that the Soren reference also discloses its layer to be highly uniformn i.e has consistent elemental uniformity of material that is consistent with single phase alloy layer.

Therefore Applicants argument w.r.t claims 1and 2 are not persuasive and they are finally rejected.

Applicants' arguments with respect to claim 3 that Fiesalmann ' 023 patent teachings should be limited to a halide containing different Group 4a atom is again unduly restricting '023 patents' teachings because Fiesalmann means a compound containing a halide component in a different 4a group atom (other exampleslisted in col.5 etc.) and Applicants' are trying to assert that the above only means a halide and should be limited to halogens only (Flouride, chloride, bromide or iodide) .

However Applicants' position can be persuasive because If Soren reference meant only a halide and should be limited to halogens only (Flouride, chloride, bromide

or iodide) then it was not necessary for Soren to mention a compound containing a halide component in a different 4a group atom (emphasis supplied).

Secondly Applicants' admit claim 3 uses H3 SIO3SCF3 (triflouromethanesulfonate , underlining " fluoro " supplied) i.e a group 4a atom containing a halide (herein flouro) component.

Therefore all of Applicants' arguments are not persuasive and all claims are finally rejected.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. Rao whose telephone number is (571) 272-1718. The examiner can normally be reached on 8.30-5.30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1714. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Steven H . Rao

Patent Examiner

Feb. 27, 2007.

HOWARD WEISS
PRIMARY EXAMINER